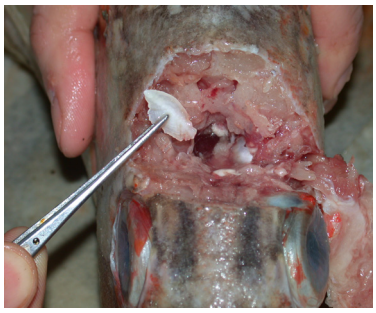
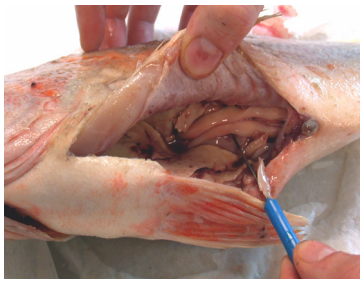
Chapter 7



Biological Sampling



I. Introduction

Observer programs provide an excellent way to collect biological specimen information for use by fisheries biologists and stock assessment analysts. Observers in the WCGOP are asked to collect fish lengths, weights, sexes, otoliths, viabilities, tags, and scales in an effort to improve understanding of various fish stocks.

II. Types of Biological Data Collected

There are seven types of biological data WCGOP observers collect:. Biological data is specific information on an individual fish. Biological data includes physical characteristics of an individual and dissections (the collection of structures, organs, or other body parts) from an individual. Biological data collected by observers includes:

- Length
- Sex
- Otoliths
- Scales
- Snouts
- Viability
- Tissue

Note: Biological samples from marine mammals, sea birds, and sea turtles are discussed in Chapter 8, "Marine Mammals, Seabirds and Sea Turtles".

This chapter briefly discusses each biological sample type. Instructions on how to collect each type are found in the WCGOP Species ID Manual.

Lengths

Observers collect lengths from a variety of species, including rockfish, flatfish, sablefish, Spiny dogfish sharks, and Longnose skates. Observer collected discarded fish lengths will be used in assessment models to determine selectivity of the gear and age population of the discard.

Sexes

Observers collect sex information from sablefish, Petrale sole, Spiny dogfish shark, Longnose skate, Cabezon, Kelp greenling, and California sheephead. Sex information can be used to determine male to female ratio of the discard.

Only two species, sablefish and Petrale sole are cut open to determine sex. The remaining species are sexed visually, as they are sexually dimorphic.

Otoliths

Otoliths are calcium carbonate structures found in many fish species. Otoliths grow in size with the fish and display their growth in annual rings, or annuli. The number of annuli are counted (or read) by scientists to determine the age of the fish. Otoliths are collected from two species, Cowcod rockfish and Yelloweye rockfish. These two species are not allowed to be retained in any fishery, therefore observer collected data is the only information stock assessors will receive from the fishery.

Scales

Salmon scales are used to verify species identification. Salmon are often extremely difficult to identify when caught either because of damage incurred during gear retrieval or strange coloration due to the proximity of spawning.

Snouts

Salmon snouts are collected because they contain coded wire tags. The snout information is used by endangered species scientists to determine mortality associated with the fishery, as well as population and migration patterns.

Coral Tissue

Genetic information from the tissue of corals is used by habitat scientists to identify where various coral species are encountered by the fishery.

Viabilities

Pacific halibut viabilities (injury data) are used to assess the mortality rate of Pacific halibut due to commercial fishing. The injury data collected by observers are analyzed by staff from the International Pacific Halibut Commission (IPHC) and used to estimate yearly mortality rates.

III. Collection and Documentation of Biological Samples

Biological information is collected from individual fish for a variety of reasons. In some instances it is necessary that the information be collected in a random fashion while in others, such as with tagged fish, information is collected in a non-random fashion. Some biological samples are taken from within the species composition sample while others are taken from outside the species composition sample. Consider these two questions with all biosamples taken:

- Does the fish need to be randomly collected?
- Is the fish from inside or outside the species composition sample?

The discussions of when biosamples are taken in the next section will include information on whether the samples are

random/nonrandom and inside/outside of the species composition sample.

Random Sampling

In general, individuals used for biospecimen sampling should be selected from within a species composition sample. Only on rare occasions is it necessary to create an independent random sample for biological specimens.

Random Sampling Within a Species Composition Sample

Selecting individuals for biological sampling from within a species composition sample is encouraged. When collecting individuals from inside a species composition sample, all of the individuals of a single species make up a single population (see Chapter 3, "Observer Basics" for a review of Random Sampling Theory). There are two ways that a random sample can be taken from a population.

- **All** individuals in the population are selected.
- A random subsample of the individuals in the population is selected.

Subsamples may be taken using any one of the following random sampling methods.

- Spatial – Randomly select a unit of gear or an area (portion of deck or bin, specific basket) to collect individuals from.
- Temporal – Randomly select a point in time to collect individuals.
- Systematic – Select a random start point (spatial or temporal) and take individuals at set intervals. In order to use a systematic system you must know approximately how many of the target species are in the population.

Example:

1. The crew on a trawler is sorting out a scupper and the observer is whole hauling the discard.
2. The observer estimates that 100 Pacific Ocean Pearch (POP) will be discarded. There are no other priority species present.
3. The observer refers to the Biological Sampling chapter in his manual and verifies that he needs to take lengths from 30 to 45 of the discarded POP.
4. The observer decides to do a systematic subsample of the POP within his species composition sample.
5. The observer divides the estimated number of POP in the haul by the number he needs to sample (100 /20 = 5). This tells him he need to collect 1 fish out of every 5.
6. The observer randomly selects a number between 1 and 5. He selects 5. This will be the first POP collected.
7. The observer collects the fifth POP the crew sorts and every 5^{th} POP thereafter (5^{th}, 10^{th}, 15^{th}, 20^{th}, 25^{th}…) for biological specimen sampling.
8. The POP lengths will be recorded on the Length Frequency form with a sample method of 9 – Inside and Random.

Random Sampling Outside a Species Composition Sample

Selecting individuals for biospecimen sampling from outside a species composition sample should be a rare event.

Example:

1. The observer on a longline vessel is tallying skates 1-10 and 21-30 of a 40 skate set.

2. The observer needs to collect lengths and viabilities on Pacific halibut. Viabilities need to be taken immediately as normal crew handling is to release the fish right away and viabilities must be taken at normal point of release.
3. The observer determines during the initial tally period that approximately 10 Pacific halibut are being caught on every skate.
4. The observer calculates that during the non-tally periods (20 skates) 200 Pacific halibut will be caught. He wants to take lengths and viabilities from 20.
5. The observer divides the estimated number of Pacific halibut that will be caught during the non-tally period by the number he wants to take data from (200/20 = 10). This tells him he needs to sample 1 fish out of every 10.
6. The observer randomly selects a number between 1 and 10. He selects 2. This means that the second Pacific halibut caught will be his first sample fish.
7. The observer asks the gaff-man to land the second Pacific halibut that comes up during the non-tally period. He records the length and viability of this fish.
8. The observer then asks the gaff-man to land every 10th Pacific halibut caught thereafter and takes lengths and viabilities on all of them (the population in this case is every 10th fish, beginning with fish #2).
9. The viabilities will be recorded on the Biological Specimen form with a sample method of 7 – Outside and Random.

IV. Data Collection Priorities

Biosamples are taken from:

- Tagged Fish (non-salmonid)
- Salmon species

- Priority Species
- Coral
- Pacific halibut

Tip* Biological sampling should only be undertaken after collecting comprehensive catch and species composition information. If necessary, a subsample for species composition (at least 500 lbs) can be taken to allow for biological sampling

This section will detail what is collected and when from each of the above groups. The following information will be covered:.

- **Sample Type(s)** - This section lists the types of samples, such as length, sex, and otoliths, that are taken from the group.
- **Random/Nonrandom and Inside/Outside** - This section details whether biosampling of the species should be done in a random or nonrandom manner and if the individuals should fall inside or outside of species composition samples.
- **Biosampling Protocol** - This section details the logistics of collecting biosamples. The "how-to" information, such as how to length fish or how to sex fish, is found in the WCGOP Species ID Manual.
- **Documentation** - This section documents which of the five forms the biological information should be documented on. For Instructions on completing forms, see "Data Collection Forms" on page 26

Tagged Fish (Non-salmonids)

Fish are tagged by a variety of educational institutions, state agencies, and federal agencies. Tagged fish are used to study fish migration, stock separation, fishing related mortality, and population dynamics.

Tagged species include Pacific cod, Pacific halibut, California halibut, pollock, sablefish, rockfish, and shortspine thornyhead.

Sample types collected from non-salmonid tagged fish:

1. Length
2. Weight
3. Sex
4. Otoliths

Recognizing Tagged Fish

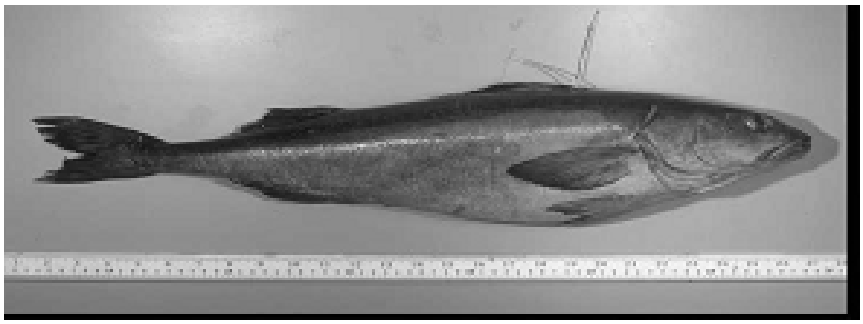


Figure 7-1: Tagged Sablefish

Tags for fish other than salmon are usually externally located on the dorsal surface or on the gill cover (See Figure 7-1). Spaghetti tags are the most common type of external tag but some fish may have disc-shaped tags.

Random/Nonrandom and Inside/Outside

Tagged fish are sampled in a **nonrandom** manner. Tagged individuals are sampled specifically because they are tagged and not because they are representative of the population.

Tagged fish can be taken from **inside** or **outside** a species composition sample. Often tagged fish do not fall within a species composition sample so these individuals are associated with the catch category only, and are outside of the species composition sample.

Biosampling Tagged Fish

All tagged fish caught should be collected and sampled.

1. Inform skipper and crew members that all tagged fish will be sampled and that their help in the collection of these fish would be appreciated. Tagged fish should be given to the observer prior to any processing (i.e. heading and gutting).
2. Upon receipt of a tagged fish:
    - If fish is **DEAD,** remove the external tag. **Do not remove tag from LIVE fish. Instead, record the tag number.**
    - Weigh fish
    - Length fish
    - Sex fish - **Do not sex LIVE fish.**
    - Collect otoliths, if required. **Do not collect otoliths from LIVE fish.**

Documenting Tagged Fish

- Complete a **Tagged Fish Form**.

Tip* The Tagged Fish form requires information from the crew member who found the tag. This allows them to receive a reward. Always fill out the Tagged Fish form as soon as possible.

- Complete a **Biospecimen Form**. Record the tag number in the Comments field.

There are 8 species of salmonids encountered in the Eastern Pacific:
King (Chinook)
Silver (Coho)
Sockeye (Red)
Chum (Dog)
Pink (Humpback)
Atlantic salmon
Steelhead (Sea-run Rainbowsbows)
Cutthroat trout

Data Collection from Salmon

Salmon pose two unique problems. First, they are difficult to identify correctly. Second, determining whether a salmon has an internal coded wire tag (CWT) or a passive integrated transponder (PIT) tag is impossible without a scanner. In previous years tagged salmon were identified by a clipped adipose fin. However, changes in clipping techniques has resulted in some tagged salmon having clipped adipose fins and some not.

To solve the identification issues observers collect scales which are used to confirm identification of salmon species. Observers also collect snouts from salmon, which are later checked for the presence/absence of CWT and PIT tags.

Sample types to collect from salmon:

1. Length
2. Weight
3. Sex
4. Scales
5. Snouts

Random/Nonrandom and Inside/Outside

Salmon are collected in a **random** manner. Depending on the number of them in a haul, all salmon may be sampled or a random subsample may be taken.

Salmon that are sampled should be from **inside** a species composition sample.

Biosampling Salmon:

All **Discarded** salmon should be sampled.

- Inform skipper and crew members that all salmon will be sampled and their help in the collection of these fish would be appreciated.

Tip* All salmon caught with trawl gear have incurred enough scale loss and other trauma to be considered dead, even if they are flopping around.

- Upon receipt of salmon:
  - Length each salmon.
  - Sex each salmon.
  - Collect scales from salmon:
    - If individual is one of the first five fish of each salmon species encountered during your first contract or the first two fish from a subsequent contract.
    - If species identification is in doubt.
    - If snout is collected.
  - Collect snout from salmon:
    - If 5 or less individuals are in the haul, collect snouts from all individuals.
    - If more than 5 individuals are in the haul, take a random subsample. Collect, at minimum, 5 snouts per haul.

Documenting Salmonids

- Complete a **Biospecimen Form**.
- Record information on **Salmon Scale envelope** when scales are taken.
- Complete a **Specimen Collection Label** and include the set/retrieval location on the back of the label. Place the label inside the bag with the snout.

Discarded Priority Species Biosampling in the Trawl Fishery

Priority species are those that are in the Pacific Coast Groundfish FMP and are currently or soon to be assessed for the status of their population. There are over 40 such species. Priority species sampling varies by fishery, with different priorities for trawl fisheries, non-nearshore fixed gear fisheries, and the nearshore fixed gear fisheries. This section will detail priority species sampling in the trawl fisheries.

Sample types to collect from priority species:

1. Length
2. Sex
3. Otoliths

Depending on the species, one or more of these sample types are required.

Random/Nonrandom and Inside/Outside

All **DISCARDED** priority species sampling must be done **randomly**. The fish used for biological samples are meant to be representative of the population so therefore must be selected in a random manner.

Discarded priority species biological samples must be from **inside** a species composition sample.

Biosampling Priority Species on Trawlers:

There are 32 species that are sampled in the trawl fishery. Due the large number of species, the WCGOP split the species into three lists, each with 12 species. Only one list will be used for each haul. The three lists are:

Biosampling List 1	Biosampling List 2	Biosampling List 3
Cowcod rockfish[L, O]	Cowcod rockfish[L, O]	Cowcod rockfish[L, O]
Yelloweye rockfish[L, O]	Yelloweye rockfish[L, O]	Yelloweye rockfish[L, O]
Canary rockfish[L]	Darkblotched rockfish[L]	Pacific Ocean Perch[L]
Widow rockfish[L]	Blackgill rockfish[L]	Bocaccio rockfish[L]
Shortspine thornyhead[L]	Yellowtail rockfish[L]	Sablefish[L, S]
Lingcod[L]	Dover sole[L]	Longspine thornyhead[L]
Petrale sole[L, S]	Starry flounder[L]	English sole[L]
Spiny Dogfish Shark[L, S]	Arrowtooth flounder[L]	Longnose Skate[L, S]
Pacific sanddab[L]	Splitnose rockfish[L]	Chilipepper rockfish[L]
Bank rockfish[L]	Silvergrey rockfish[L]	Rougheye rockfish[L]
Greenstripe rockfish[L]	Shortraker rockfish[L]	Redbanded rockfish[L]
Redstripe rockfish[L]	Aurora rockfish[L]	Stripetail rockfish[L]

Overall Biological Sampling Goal: Using only fish in **DISCARDED** species composition samples, collect biological samples from 2 to 5 individuals of as many

species on list as possible. Take up to 30 - 45 samples per haul.

1. For each trip, randomly select which biosampling list to use on the first haul. **Document the list being used on the Catch or Species Composition Form.**
    - Use the Random Number Table to select a number between 1 and 3. Use the randomly selected list on the first haul.
    - Use the next list for the second haul. For instance, if you randomly selected to start with biosampling list 2, use biosampling list 3 on haul 2. If you randomly selected biosampling list 3 to start with, use biosampling list 1 for haul 2.

Tip* If none of the species within the priority list are in a **DISCARDED** species composition sample, do not take any biological samples from that haul. Do not go on to the next list until the next haul.

2. Collect 2 to 5 individuals, starting with the first species and working down through the 12th species until 30 to 45 individuals have been sampled.
    - If there is only 1 individual of a species in the species composition sample, take samples from that individual.
3. Collect the appropriate sample types from individuals. Sample types needed are listed next to each species in the table above.

L = Length

S = Sex

O = Otolith

Documenting Priority Species:

- **Length Frequency Form** – Used when only length and sex were taken.
- **Biological Specimen Form** – Used for individuals that had additional samples (weight, otoliths, other) taken.

Discarded Priority Species Biosampling in Non-Nearshore Fixed Gear Fisheries

Sample types to collect from priority species:

1. Length
2. Sex
3. Otoliths

Depending on the species, one or more of these sample types are required.

Random/Nonrandom and Inside/Outside

All **DISCARDED** priority species sampling must be done **randomly**. The fish used for biological samples are meant to be representative of the population so therefore must be selected in a random manner.

Discarded priority species biological samples must be from **inside** a species composition sample.

Biosampling Priority Species in the Non-Nearshore Fixed Gear Fisheries

There are only 16 species that are caught in the non-nearshore fixed gear fisheries from which biological samples need to be collected.

Overall Biological Sampling Goal: Using only fish in **DISCARDED** species composition samples, collect biological samples from 2 to 5 individuals from as many of

the 16 species as possible. Take up to 30 - 45 samples per set.

L = Length

S = Sex

O = Otoliths

1. Take Lengths and Otoliths from all **DISCARDED Cowcod rockfish**[L, O] and **Yelloweye rockfish**[L, O].
2. Take sexed lengths from 5 randomly selected, **DISCARDED Sablefish**[L, S]
3. Collect 2 to 5 individuals from each species on the following list that is in a **DISCARDED** species composition sample.
   - If there is only 1 individual of a species in the **DISCARDED** species composition sample, take samples from that individual.
4. Collect the appropriate sample types from individuals. Sample types needed are listed next to each species in the table above.

L = Length

S = Sex

O = Otolith

Blackgill rockfish[L]	Bocaccio rockfish[L]	Darkblotched rockfish[L]
Shortraker rockfish[L]	Yellowtail rockfish[L]	Longspine thornyhead[L]
Rougheye rockfish[L]	Spiny Dogfish shark[L, S]	Shortspine thornyhead[L]
Canary rockfish[L]	Widow rockfish[L]	Pacific Ocean Perch[L]
Lingcod[L]		

Documenting Priority Species:

- **Length Frequency Form** – Used when only length and sex were taken.
- **Biological Specimen Form** – Used for individuals that had additional samples (weight, otoliths, other) taken.

Discarded Priority Species Biosampling in Nearshore Fixed Gear Fisheries

Sample types to collect from priority species:

1. Length
2. Sex **(VISUAL ONLY)**

Depending on the species, one or all of these sample types are required.

Random/Nonrandom and Inside/Outside

All **DISCARDED** priority species sampling must be done **randomly**. The fish used for biological samples are meant to be representative of the population so therefore must be selected in a random manner.

Discarded priority species biological samples must be from inside a species composition sample.

Biosampling Priority Species in Nearshore Fixed Gear Fisheries

Overall Biological Sampling Goal: All **DISCARDED** commercially important species should be sampled.

1. Take biological samples from ALL **DISCARDED** individuals of the following species:

All rockfish species[L]	White croaker[L]
Lingcod[L]	Rock greenling[L]
Kelp Greenling[L, S]	California sheephead[L, S]
Cabezon[L]	CA scorpionfish[L]

2. Collect the appropriate sample types from individuals. Sample types needed are listed next to each species in the table above.

L = Length

S = Sex**

****Nearshore discard is usually released alive. All sexing must be based on visual characteristics only. **Do not ever cut open live discard in the nearshore fishery to determine sex!**

Documenting Priority Species:

- **Length Frequency Form** – Used for individuals that only length and sex was taken.
- **Biological Specimen Form** – for individuals that had additional samples (weight, otoliths, other) taken.

Data Collection from Coral

Corals are part of a group referred to as structure forming mega-faunal invertebrates. This group also includes sponges (Phylum Porifera) and Hydrocorals (Hydrozoa). Coral groups found along the West Coast include, but are not limited to: black corals (Antipatheria), coral anemones (Corallimorphiria), sea anemones (Actiniaria), gorgonian

corals (Gorgonacea), sea pens, whips and fans (Pennatulacea), soft corals (Alcyonacea), and stony corals (Scleractinia). Collection of specimens will aid in positively identifying where various coral species are encountered.

Structure Forming Mega-Faunal Invertebrates on the West Coast*

Scientific Name	Common Name/Group Name	Collect?
Phylum *Porifera*	Sponges (sponges)	No
Phylum *Cnidaria*		
Class *Anthozoa*		
Sub-class *Alcyonaria (Octocorallia)*		
Order *Pennatulacea*	Sea Pens and Pansies	Yes
Order *Gorgonacea*		
Sub -order *Scleraxonia*	Gorgonian Corals	Yes
Sub -order *Holaxonia*	Sea Whips and Fans	Fans only
Order *Alcyonaceans*	Soft corals (corals)	Yes
Sub-class *Zoantharia (Hexacorallia)*		
Order *Actiniaria*	Sea anemones (anemones)	No
Order *Antipatheria*	Black corals (corals)	Yes
Order *Scleractinia (Madreporaria)*	Stone corals (corals)	Yes
Class *Hydrozoa*		
Order *Hydroida*	Hydrocorals (corals)	Yes
* Five additional *Anthozoan* orders may be present on the coast .		
(*Stolonifera, Telestacea, Zoanthidea, Corallimorphiria and Ceriantharia)*		

* Five additional 'coral' orders may be present on the coast (Stoloniferea, Tellestecea, Zoanthidea, Corallimorphiria and Ceriantharia).

Sample types to collect from coral:

1. Tissue sample

Random/Nonrandom and Inside/Outside

Coral samples should be taken from all live or recently dead coral, which, means that they are taken **randomly**.

Coral will normally be from **inside** of a species composition sample.

Biosampling Coral:

1. Collect all live or recently dead corals in the haul. The determination of being alive or recently dead is made by the presence of soft tissue that does not appear to have deteriorated.
2. Use the WCGOP Invertebrate ID manual to separate mega-faunal invertebrates into one of the following groups: sponges, sea anemones, black corals, gorgonians, soft corals, stone corals, hydrocorals, or sea pens/ whips

    - If unable to identify the specimen, record it as unidentified, at the most discrete level possible (e.g. – coral, unidentified; invertebrate, unidentified).

3. Weigh the coral specimen.
4. Collect **two** small tissue samples. Refer to WCGOP Species ID guide for details on specimen collection.

Documenting Coral Information:

- Always use **Biological Specimen Form** – Document dissection type 4 - Tissue.

Data Collection from Pacific Halibut

The purpose of taking viabilities is to ascertain the condition of the fish when it returns to the sea. So, only collect viabilities from **DISCARDED** Pacific halibut that have undergone NORMAL handling by the crew.

The injury criteria and viability codes used to assess Pacific halibut viabilities vary by gear type. Make sure to use the correct set of criteria and codes when making injury assessments.

Sample types to collect from Pacific halibut

1. Length
2. Viability

Figure 7-2: Pacific halibut

Random/Nonrandom and Inside/Outside

Pacific halibut viabilities must be collected **randomly** as they must be representative of the population.

In most circumstances, Pacific halibut viabilities will be from **outside** of a species composition sample. Usually observers length the halibut and use the length/weight conversion table to determine a weight. Since there is not an actual weight, the individuals are not on the Species Composition form. Only if the Pacific halibut are actually weighed would they be from inside a species composition sample.

Biosampling Pacific halibut

1. Collect all or a random subsample of **DISCARDED** Pacific halibut caught in the haul.
2. Measure the fork length of the Pacific halibut.
3. Closely examine the Pacific halibut on both sides for injuries.
    - Use the appropriate Pacific halibut injury key to assign a viability code to the fish. Injury keys are

located in the appendices as follows: Trawl (see Appendix L: Injury Key for Trawl Caught Pacific Halibut on page 31), Pot (see Appendix M: Injury Key for Pot Caught Pacific Halibut on page 32) or Hook and Line (see Appendix N: Injury Key for Hook & Line Caught Pacific Halibut on page 34).

Documenting Pacific halibut Information:

- Always use the **Biological Specimen Form**.

Documenting Biological Samples

Biological information is collected from individual fish for a variety of reasons. In some instances it is pertinent that the information be collected in a random fashion while in others, such as with tagged fish, information is, of necessity, collected in a non-random fashion.

There are four sample methods for biological sampling. The primary factors used to differentiate these methods are:

- Whether the individuals used for biological sampling were within the species composition sample
- Whether the individuals used for biological sampling were randomly selected.

Inside vs. Outside

Was the individual being sampled for biological specimens documented on the Species composition form?

Yes = Inside sample
No = Outside sample

Biological Sampling Methods

Sample Method 6 – Outside and Nonrandom

- Individuals are not part of a species composition sample and have NOT been randomly selected.
- Use this method for tagged fish that have been collected opportunistically during a haul/set.

Sample Method 7 – Outside and Random

- Individuals are not part of a species composition sample and have been randomly selected.

- Use this method for Pacific halibut when lengths/ viabilities have been taken for randomly selected individuals from the haul/set but there was not a species composition sample because actual weights of halibut were not obtained.

Sample Method 8 – Inside and Nonrandom

- Individuals are part of a species composition sample and have NOT been randomly selected.
- Use this method for tagged fish that have been collected opportunistically from a species composition sample.

Sample Method 9 – Inside and Random

- Individuals are part of a species composition sample and have been randomly selected.
- Use this method when taking biological data from all individuals or from randomly selected individuals of a particular species within a species composition sample.

Tip* If average weight individuals were taken from outside of the tally sample on a fixed gear vessel and those same individuals are used for biological sampling, they are considered inside and random.

V. Data Collection Forms

There are five data collection forms to use when collecting biospecimen information.

1. **Length Frequency Form-**Use this form to record species, sex, and length data when only this information is being collected.
2. **Biospecimen Form -**Use this form to record data for individual fish when any information beyond species,

sex, and length has been collected. Use this form to record Pacific halibut viabilities. Use this form to record data when otoliths, scales, snouts or tags have been collected.

Tip* Record data on either the Length Frequency or the Biospecimen Form. **NEVER** record data from a single fish on both forms or the fish will be counted twice.

3. **Tagged Fish Form-** Use this form to record data for non-salmonid tagged fish.
4. **Salmon Scale Envelope** - The envelope is used to hold salmon scales only. Several fields of information must be completed on the front of the envelope.
5. **Specimen Collection Label-**Use this label to record data when salmon or sablefish snouts have been collected. Use this label to record data when whole fish/ invertebrates have been collected.

Length Frequency Form Instructions

Complete the Length Frequency Form for fish when only length and/or sex information is taken Fish should be grouped together whenever the species, length and sex for all the fish in the group are the same. An example of the form is included as Figure 6-16.

- **Haul Number –** Record the number of the haul that the sample came from.
- **Date –** Record the date as MM/DD/YY.
- **Trip Number –** Record the trip number generated by the database system.

- **USCG # –** Record the USCG vessel number (if they have one). If the vessel does not have a USCG number, leave this field blank

- **Catch # -** Record the number that corresponds to the catch category on the Catch Form.

- **Catch Category –** Record in capital letters the catch category the species is in as recorded on the Catch Form.

- **R or D –** Record whether the sample came from an **R** – Retained or **D** – Discarded catch category.

- **Species Name -** Record the **common name** of the species the length frequencies were taken from. This column must be filled in with the species name. Do not only enter the species code! The common name listed on the paperwork must match the common name used in the database.

- **Species Code** - Record the species code of the corresponding species. See Appendix A: Fish Species List and Codes on page 2 and Appendix B: Invertebrate Species List and Codes on page 14 for lists of species and species codes.

- **Method –** Record the Biological Sampling Method used to obtain fish for length frequencies.
  - 6 - Outside and Nonrandom
  - 7 - Outside and Random
  - 8 - Inside and Nonrandom
  - 9 - Inside and Random

- **Sex –** Record **M** – Male, **F** – Female, or **U** – Unknown (individuals where the sex cannot be determined). If you

did not attempt to sex the individual, LEAVE THE COLUMN BLANK!

- **Length –** Record the length of the group of fish, in centimeters.

- **Freq –** Record the number of individual fish in each length group.

- **KP Length –** Sum up all of the length **by species** and note total of all lengths in the KP Length (keypunch length) column.

- **KP Frequency -** Sum up all of the frequencies **by species** and note total of all frequencies in KP Freq (keypunch frequency) column.

Figure 7-3: Length Frequency Form

Biospecimen Form Instructions

Complete the Biospecimen Form any time data beyond species, sex, and length are collected on an individual fish. Complete this form when collecting Pacific halibut viabilities, otoliths, scales, snouts or tags. This form is also often used to record individual weights and lengths of fish caught in the Live Fish fishery. An example of the form is included as Figure 6-17.

- **Haul Number –** Record the number of the haul that the sample came from.

- **Date –** Record the date as MM/DD/YY.

- **Trip Number –** Record the trip number generated by the database system.

- **USCG # –** Record the USCG vessel number (if they have one). If the vessel does not have a USCG number, leave this field blank.

- **Catch # -** Record the number that corresponds to the catch category on the Catch Form.

- **Catch Category –** Record in capital letters the catch category the species is in as recorded on the Catch Form.

- **R or D –** Record whether the sample came from an **R** – Retained or **D** – Discarded catch category.

- **Species Name -** Record the **common name** of the species. This column must be filled in with the species name. Do not only enter the species code! The common name listed on the paperwork must match the common name used in the database.

- **Species Code** - Record the species code of the corresponding species. See Appendix A: Fish Species List and Codes on page 2 and Appendix B: Invertebrate Species List and Codes on page 14 for lists of species and species codes.

- **Method –** Record the Biospecimen Sampling Method used to obtain fish for biospecimens.
  6 - Outside and Nonrandom
  7 - Outside and Random
  8 - Inside and Nonrandom
  9 - Inside and Random

- **Sex –** Record **M** – Male, **F** – Female, or **U** – Unknown (individuals where the sex cannot be determined). If you did not attempt to sex the individual, LEAVE COLUMN BLANK.

- **Length –** Record the length of the individual fish in whole centimeters.

- **Weight –** Record the weight of the individual fish. Do not use extrapolated or halibut conversion weights.

- **Viabilities –** Record the viability for **Pacific halibut ONLY**. Refer to Appendix L: Injury Key for Trawl Caught Pacific Halibut on page 31, Appendix M: Injury Key for Pot Caught Pacific Halibut on page 32 and Appendix N: Injury Key for Hook & Line Caught Pacific Halibut on page 34 for viability criteria.

Trawl and Pot

D = Dead
P = Poor
E = Excellent

Hook and Line Gear

D = Dead
S = Severe
MO = Moderate
MI = Minor

- **Maturity Stage** – Record the maturity stage of the individual fish. This field should be left blank at this time.

- **Dissection Type –** Record the type of dissection that was taken.
  1-Otoliths
  2-Scales
  3- Snout
  4-Tissue

- **Barcode # –** Record the barcode number of the vial, envelope, or other container that the dissected part was placed in.

- **Dissection Type –** Record the type of dissection that was taken.
  1-Otoliths
  2-Scales
  3- Snout
  4-Tissue

- **Barcode # – If two dissections were taken from the same individual**, record the barcode number of the vial, envelope, or other container that the dissected part was placed in.

- **Comments –** Record the tag number if the individual was tagged. Document any important information regarding the individual fish.

- **KP Length –** Sum up all of the lengths **by species** and note total of all lengths in the KP Length (keypunch length) column.

- **KP Frequency -** Sum up all of the frequencies **by species** and note total of all frequencies in KP Freq (keypunch frequency) column..

Haul # ☐☐ **BIOSPECIMEN FORM** Page ____ of ____

Date ☐☐☐☐☐☐ Trip Number ☐☐☐☐☐ USCG # ☐☐☐☐☐☐☐

Catch #	Catch Category	R or D	Species Name	Species Code	Method	Sex	KP Length / KP Weight	Length	Weight	Viability	Maturity stage	Dissection Type	Barcode #	Dissection Type	Barcode #	Comments (including Tag #)

Figure 7-4: Biospecimen Form

Tagged Fish Form Instructions

Only complete the Tagged Fish Form for tagged fish. Attach the tag and otoliths directly to the form. An example of the form is included as Figure 6-18.

- **Trip No.** – Record the trip number generated by the database system.

- **Vessel ID No. –** Record the USCG number or state registration number (begins with CF, OR or WN) of the vessel.

- **Base Permit No.** – Record the Groundfish Permit number.

- **Observer Name** – Record your first and last name.

- **Vessel Name** – Record the name of the vessel on which the tag was collected.

- **Captain (or reward recipient's) Name** – Record the name of the person who found the tag or to whom any reward will be given. If the observer finds the tag, record the name of the vessel skipper or as otherwise instructed by the skipper.

- **Address** – Record the address of the reward recipient.

- **Species** – Record the common name of the species from which the tag was collected.

- **Tag Prefix and Serial No**. – Record this data if discernible from the tag.

- **Tagging Agency** – Circle which agency/lab tagged the specimen as recorded on the tag (if discernible).

- **Time and Date of Capture** – Record the retrieval time of the haul/set as MM/DD/YY.

- **Capture Location** – Record the retrieval position (latitude and longitude) of the haul/set.

- **Sex and Maturity of Gonads** – Record the sex of the fish. Do not record maturity stage.

- **Length** – Record the fork length of the fish in centimeters.

- **Weight** – Record the weight of the fish in pounds.

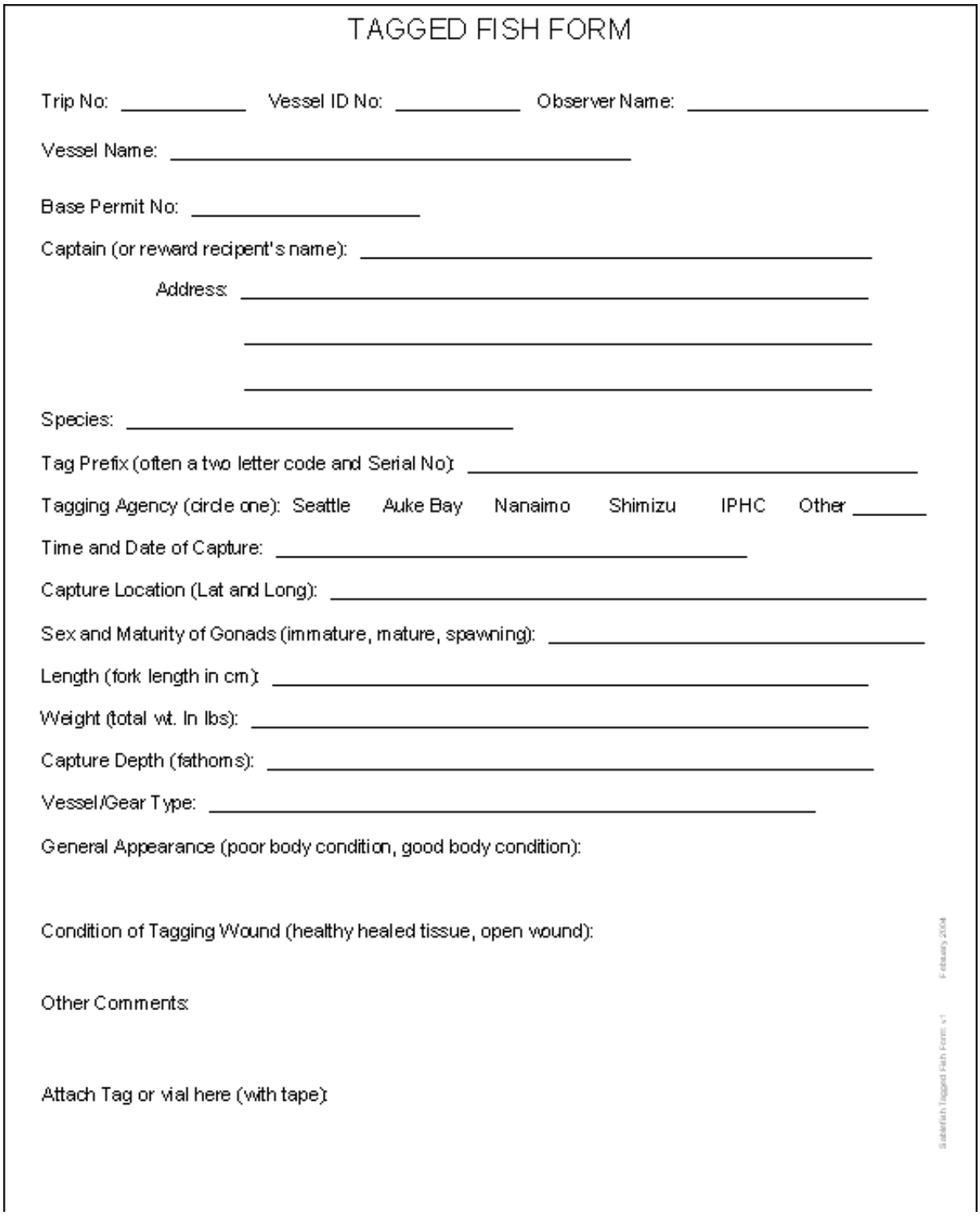
- **Capture Depth** – Record the retrieval depth of the haul/set in fathoms.

- **Vessel/Gear Type** – Record what gear type was utilized when the fish was captured (bottom trawl, midwater trawl, pot, longline, etc.)

- **General Appearance** – Note condition of the body including any wounds, scars or abnormalities.

- **Condition of Tagging Wound** – Note condition of the area around tag (open wound, scarred over, etc).

- **Other Comments** – Note anything else unusual or pertinent to the tagged fish.



TAGGED FISH FORM

Trip No: _____ Vessel ID No: _____ Observer Name: _____

Vessel Name: _____

Base Permit No: _____

Captain (or reward recipent's name): _____

Address: _____

_____

_____

Species: _____

Tag Prefix (often a two letter code and Serial No): _____

Tagging Agency (circle one): Seattle Auke Bay Nanaimo Shimizu IPHC Other _____

Time and Date of Capture: _____

Capture Location (Lat and Long): _____

Sex and Maturity of Gonads (immature, mature, spawning): _____

Length (fork length in cm): _____

Weight (total wt. in lbs): _____

Capture Depth (fathoms): _____

Vessel/Gear Type: _____

General Appearance (poor body condition, good body condition):

Condition of Tagging Wound (healthy healed tissue, open wound):

Other Comments:

Attach Tag or vial here (with tape):

Figure 7-5: Tagged Fish Form

Salmon Scale Envelope Instructions

SPECIES _____	DISSECTION NO. _____
TRIP NO. _____	HAUL/SET _____
DATE _____	MISSING ADIPOSE? Y or N
FORK LENGTH _____ (CM)	SEX _____
WT. _____ (LBS)	SCALE ZONE _____

Figure 7-6: Salmon Scale Envelope

- **Species** - Record the **common name** of the species that the scales came from.
- **Dissection No.** - Attach a barcode label in this field.
- **Trip No.** - Record the trip number generated by the database system.
- **Haul/Set** - Record the number of the haul that the sample came from.
- **Date** - Record the date as MM/DD/YY.
- **Missing Adipose?** - Circle **Y** - Yes if the salmon was missing the adipose fin. Circle **N** - No if the salmon was not missing the adipose fin.
- **Fork Length** - Record the length of the fish, in centimeters.
- **Sex** - Record **M** - Male, **F** - Female, or **U** - Unknown (individuals whose sex cannot be determined).
- **Wt** - Record the weight of the fish in lbs.

- **Scale Zone** - Record the zone the scales were taken from: **A, B, or C.**

Only collect sablefish heads from those with BLUE spaghetti tags.

Specimen Collection Label Instructions

Complete the Specimen Collection Label when salmon snouts or sablefish heads have been collected or when a whole fish or invert has been collected. Use a pencil to complete this form. An example of the form is included as Figure 6-19.

Tip* Before going to sea, take 10 – 20 specimen collection labels and place a WCGOP bar code sticker on the back of the each label while the labels are clean and dry.

- **Vessel Name** – Record the name of the vessel on which the specimen was collected.

- **Haul Number** – Record the haul number from which the specimen was collected.

- **Trip Number** – Record the trip number generated by the database system.

- **Date** – Enter the date that the haul/set was retrieved as MM/DD/YY.

- **Species Identification** – Record the common name of the species.

- **Entered As** – Record the species name entered into the database, if this differs from the above (e.g. you entered it as rockfish, unidentified but believe it was a canary rockfish).

- **Depth (FM)** – Record the retrieval depth of the haul/set in fathoms.

- **Length (cm)** – Record the length of the fish, in centimeters.

- **Weight (LB)** – Record the weight of the fish, in pounds.

- **Sex** – Record the sex of the fish (if applicable).

- **Observer Name** – Record your first and last name.

- **B**ar **Code Sticker** – When collecting snouts, be sure to affix a WCGOP bar code sticker to the back of the specimen label in order to uniquely identify the specimen

.

SPECIMEN COLLECTION LABEL

West Coast Groundfish Observer Program

DOC/NOAA/NMFS/NWFSC/FRAMD

2725 Montlake Blvd. Seattle, WA 98112

(use pencil ONLY!)

VESSEL HAUL

NAME_____ NUMBER_____

TRIP

NUMBER_____ DATE_____

SPECIES IDENTIFICATION_____

ENTERED AS_____

DEPTH(FM)_____ LENGTH(CM)_____

WEIGHT(LB)_____ SEX (if applicable)_____

OBSERVER NAME_____

Figure 7-7: Specimen Collection Label